RESPONSES TO U. S. ENVIRONMENTAL PROTECTION AGENCY AND COLORADO DEPARTMENT OF HEALTH COMMENTS

FINAL PHASE I RFI/RI WORK PLAN FOR OPERABLE UNIT NO. 9 (ORIGINAL PROCESS WASTE LINES) ROCKY FLATS PLANT

U S DEPARTMENT OF ENERGY
ROCKY FLATS PLANT
GOLDEN, COLORADO

ENVIRONMENTAL RESTORATION PROGRAM

REVISION NO 1
FEBRUARY 25, 1992

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GENERAL COMMENTS

CDH-G1. The Division believes that this Phase I Workplan will adequately support RCRA closure activities within OU9. These activities will be further delineated in the Phase I IM/IRA However, we suggest that DOE and EG&G begin to develop a strategy for implementing OU9 closure(s). Based on the October 1988 Closure Plan submitted for OU9 and the brief description of the OPWL in the 1987 Part A permit application, the portions of the OPWL that need to be closed are the tanks. Normally, the pipelines would be treated as ancillary equipment to the tanks and any soil contamination would be addressed as a part of closure. In this case, however, the Division is concerned that closure of the tanks may become burdened by the need to investigate the lengthy and complicated pipeline sections that, in places, are long distances from the nearest OPWL tank. Therefore, the Division suggests that the requirements for closure can be addressed on a tank by tank basis in the Phase I IM/IRA Decision Document. These requirements would include investigation, characterization and, if necessary, removal of the tanks and only the immediately adjacent ancillary piping and soils. The remainder of the pipelines and any associated soil contamination could be investigated under the RCRA and CERCLA RFI/RI-CMS/FS process Corrective and/or remedial action addressing the pipelines could be handled in the CAD/ROD This approach would allow the portions of OU9 that need to go through closure to close as soon as possible while not compromising the investigation and characterization of the remainder

Response Comment acknowledged, no revisions to work plan necessary.

CDH-G2 The Division, in consultation with EPA, has determined that the Environmental Evaluation (EE) portion of this workplan can be omitted. Based upon the EPA's Risk Assessment Guidance for Superfund (RAGS), Volume II, and upon IAG requirements, we will be evaluating, along with the Risk Assessment Technical Working Group, whether or not EEs are appropriate for the plantsite OUs If it is determined that EEs are appropriate, we will evaluate the proper scope for plantsite EEs. In the interim, however, the Division has determined that data from an EE is not necessary to "close" (see comment 1) any portions of this OU. If the plantsite OUs are determined to need EEs, the EE for OU9 can be implemented in the Phase II RFI/RI Workplan.

Response Per subsequent discussions with EPA and CDH, the EE section of the work plan will remain in the work plan pending a February 22 EE meeting between representatives of DOE, EPA, CDH, and EG&G. DOE intends to present at this meeting an example EE for industrially developed areas of the

Rocky Flats Plant, using OU9 as an example. If this example EE is approved at this meeting, it will be incorporated into the work plan as a replacement for the existing EE section.

CDH-G3 This plan states that any OPWL beneath buildings cannot and will not be evaluated in this RFI/RI. From the standpoint of RCRA closure, the Division agrees that investigating portions of the OPWL that are not accessible under active buildings may be deferred, but all OPWL should be evaluated to the extent possible for the release of hazardous materials. In other words, the Division does not want this workplan to categorically ignore any portions of the OPWL that are under buildings. We expect covered intervals to be evaluated against

- building status -- active or inactive
- proximity of the covered OPWL to building edges
- known or suspected releases from covered portions of OPWL

If a partial investigation of a covered OPWL can evaluate the presence or absence of significant contamination beneath a building, then the work should be included in this workplan

Response OPWL components beneath buildings will be evaluated for the possibility of partial investigation during the additional data compilation activities and investigated if partially accessible The FSP has been revised to include this activity.

CDH-G4 As indicated in our cover letter, the Division concurs with the recommendation included in this workplan to make all IHSSs that target known or suspected OPWL historical releases part of OU9. This would include IHSSs 122, 147.1, 123 2, 159, 146, 126, 127, 149, 124, 125, and 132 This may necessitate modifications and additions to the FSP. If so, please expand the FSP The Division will initiate the IAG amendment procedures regarding this matter at the soonest possible time

Response· The FSP addresses all components of the OPWL and will not require revision as a result of incorporating these IHSSs into OU 9

CDH-G5 The text of this workplan does not indicate whether an evaluation has been made of the OU9 areas for rig and/or backhoe accessibility. Much of the FSP may be rendered moot if equipment access is restricted by buildings, underground utilities, overhead steam lines, etc Please evaluate the impact this issue may have on the implementation of this workplan

Response. Field access to tank locations was evaluated in October and November 1990 as part of the draft work plan preparation. This information has been incorporated into the final work plan as Appendix E, and a section on site accessibility (Section 2.3 4) has been added to the text. Because specific pipeline test pit and boring locations will depend largely on the results of additional data compilation activities, OPWL pipeline access will be evaluated during the data compilation.

CDH-G6 The Division estimates that about 200 test pits will be necessary to implement Stage I of this plan. Unless several crews are simultaneously in the field, locating, digging, and sampling this large number of pits will require a significant amount of time. This is particularly true of pits in the PSZ. We are concerned that the budget for OU9 is going to be restricted and implementation of this workplan and related data evaluation may take more time than will be available for the preparation of the RFI/RI Report A delay in the RFI/RI Report submittal may be unacceptable if based solely on budget constraints

Response Comment acknowledged, no revisions to work plan necessary.

CDH-G7 Based on an evaluation of the hydraulic conductivities of the Rocky Flats Alluvium that have been determined to date, the Division does not believe the value of 6x10E-5, presented repeatedly in the text, to be very representative In fact, most of the values for Rocky Flats Alluvium hydraulic conductivity we have seen are significantly higher (two orders of magnitude) Please check this number, particularly, in the areas immediately surrounding the OPWL If the hydraulic conductivities are indeed in the higher ranges, the conceptual mode and the FSP may need to be reconsidered

Response Section 1 3 3 8 and other areas of the text have been revised to reflect and explain the range of measured hydraulic conductivity values for the Rocky Flats Alluvium

SPECIFIC COMMENTS

CDH-S1. Section 1 2. This section states that as of early 1991, only a small fraction of the historical data in the OU 9 area had been validated. As it is now early 1992, please update the statement to reflect how much of the data has now been validated

Response. The text has been revised to include the current level of validation for OU 9 data.

CDH-S2: Section 2 3.3 4 The last sentence of the second paragraph should be changed to read, " flows eastward into Standley Lake with periodic diversions into Movar Reservoir."

Response. The text has been revised in response to this comment

CDH-S3: Section 1.3.3 7 The third paragraph on page 1-12 states that the Araphahoe Formation is approximately 150 feet thick in the center of RFP. Please state the source of this figure.

Response A reference has been provided in the text

CDH-S4 Section 1.3 3 8· The value of hydraulic conductivity stated on pages 1-14 of the text may not be representative of the upper HSU, particularly considering the fact that the upper HSU includes the Rocky Flats Alluvium, which can have K values several orders of magnitude higher than that stated (please see general comment 7)

Response· See response to comment CDH-G7

CDH-S5 Section 2 2 2 Based on the figures supplied in this section, it is unclear how the figure of 18,000 feet was calculated for the amount of OPWL pipelines that are not located beneath buildings Starting with 35,000 total feet of pipeline and subtracting 13,000 feet that are beneath buildings leaves 22,000 feet that should not be beneath buildings. Please clarify this apparent discrepancy

Response· The 18,000 foot figure was developed through direct measurement from utility maps rather than reliance on the figures provided in the Closure Plan The text has been revised to indicate this

CDH-S6 Section 2 3 3 2 This section refers to a hydraulic conductivity value that may b\not be representative for the Rocky Flats Alluvium. Please refer to General Comment 6.

Response See response to comment CDH-G7

CDH-S7: Section 2 5 2 1· This section refers to a hydraulic conductivity value that may b\not be representative for the Rocky Flats Alluvium. Please refer to General Comment 6

The second paragraph on page 2-26 defines a release of 500 gallons to be the average release volume for slower or gradual releases from the pipelines. This 500 gallon figure was then used to calculate an average spill size within the trench fill material which was, in turn, used to determine a reasonable distance between test pits This Phase I RFI/RI Workplan is supposed to completely characterize the "source and soils" within OU 9. However, the Division is concerned about two items in this conceptual model. First, 500 gallons is a rather large average spill volume, considering that most of the OPWL stood empty except when waste was being transported. Second, no consideration is being given to spills of lesser volume. As the OPWL pipelines get closer to the waste source, the total volume ever carried by the lines decreases, which lessens the probability of large but gradual leaks. Because of these items, the Division is of the opinion that this workplan and conceptual model may not fulfill its intended purpose of characterizing the soils and source.

In addition, based upon the figures presented on page 2-26, the Division was unable to re-create the result that a spill would cover a 300 foot length of pipeline trench Please verify this result and submit the calculations. The figures for porosity, density, and moisture content are assumptions Please give the source of these numbers.

Response The 200 foot maximum test pit spacing resulting from the conceptual model is a contingency in the absence of structural features (e.g., elbows, tees, valves), known release locations, or visible deterioration, and is expected to be utilized only on a few long sections of pipeline. Clearly, pipeline releases smaller than the 500 gallon conceptual model volume may have occurred No approach short of complete excavation and composite sampling could ensure that all such releases are detected The FSP is designed to provide a reasonable and diligent effort toward locating those releases which are likely to constitute a potential threat to human health or the environment. The text in the conceptual model and in the FSP (Section 7 0) has been revised to more clearly explain the significance of the pipeline release model and the rationale behind the FSP

The calculation of release spread has been provided in Table 2.8. The figures for porosity, density, and moisture content are based on average values from soil engineering texts, and match those used for a similar

calculation in the 1988 Closure Plan. This has been indicated in the calculation.

CDH-S8: Section 2 5 4· The role of a conceptual model within the RFI/RI process is to propose all possible pathways that might carry contamination to a receptor. The data that is collected from the workplan implementation determines which pathways are completed. The pathways itemized in the text of this section represent most, but not all, of the possible pathways presented by this OU. It is inappropriate to confine the investigation to just those pathways listed in this section.

The first pathway described in this section, beginning on the bottom of page 2-27, raises the issue of what the true "source" of contamination should be. The Division believes that from an IAG perspective, the term "source and soils" means the original source of the contamination and any soils that have been affected However, from a conceptual model and risk assessment point of view, the source should be whatever media is currently contributing contamination to another medium

In addition, the second pathway described in this section mentions volatilization as a release mechanism. Volatilization is shown on the conceptual model diagram (Figure 2-9), as well. However, it is not included on the conceptual model flow-chart (Figure 2-8). The Division recommends that a box for "volatilization and evaporation" be added to the "Secondary Release Mechanism" column on the flow chart so that this inconsistency can be resolved

Finally, based on the conceptual model flow-chart (Figure 2-8), the pathway "Released waste - leaching - groundwater - seepage - surface water - ingestions and dermal contact" should be added to the discussion.

Response. The pathway analysis in Section 2 5 4 has been revised to emphasize the role of the Phase I RFI/RI in evaluation of the pathways. Because only sources and soils will be characterized, the pathways can be evaluated only to the extent that sources and soils contribute to them. Only one pathway, that of direct ingestion of or dermal contact with soils, can be completely evaluated using data from the Phase I investigation Potential secondary releases from soils to other transport media (air, groundwater, surface water, and biota) can be identified using Phase I data, but will not be quantitatively evaluated until the Phase II RFI/RI

The conceptual model has been revised to define contaminated soils as a current contaminant source. "Volatilization and evaporation" is shown as a secondary release mechanism

CDH-S9: Figure 2-2 Some of the tank locations shown on this figure are not connected to the OPWL pipeline network by any of the 57 pipeline segments. Please clarify why this is the case

Response The tanks identified in this comment were portable waste containers which were physically transported to the waste treatment facility for emptying. These tanks are identified in the OPWL data summary sheets in Appendix B. The text in Section 2.2 1 has been revised to explain this.

CDH-S10. Figure 2-8: In addition to the "volatilization and evaporation" box mentioned previously, the Division suggests the addition or change of the following:

- Change the "Contaminant Source" column to "Historical Source".
- Add a new column entitled "Current Source". Under this header would appear boxes for "OWPL pipelines and tanks" and for "soils and pavement' (soils and pavement should not be called transport media).
- Delete the word "sediments" from the "surface water/sediments' box. Only surface water, groundwater, air, and biota can act as transport media
- Additional release mechanisms need to be incorporated into this flow-chart These include
  - volatilization/evaporation
  - groundwater pumpage (for future-use scenario)
  - deposition/precipitation
- The box for "infiltration/leaching" should be split into two separate boxes, the infiltration box should be changed to read "infiltration/percolation" and the leaching box should be changed to read "leaching/percolation" These are two distinctly different processes that each could impact OU 9 soils contamination differently.
- Add an arrow from the surface water box to the wind erosion box and to the volatilization/evaporation box

Response Figure 2-8 has been revised to incorporate these comments

CDH-S11: Table 2 5: Are the values presented on this table average values, typical values, or single well values? This table presents a large range of hydraulic conductivity values for the Rocky Flats Alluvium (three orders of magnitude) that are not fully represented elsewhere in this workplan. Please clarify this inconsistency

Response Table 2 5 has been revised to include the derivation of the listed values.

CDH-S12 Figure 2-6 Please clarify in what time frame the data used to construct this map was collected (i.e., is this from one particular quarterly well sampling event? If so, which one?)

Response The figure has been revised to indicate the quarterly sampling results depicted

CDH-S13 Section 3.0 The Division will withhold comments to this section until such time as the site-wide chemical specific potential ARAR issues have been resolved The Division reserves the right to comment on this section at that time.

Response Comment acknowledged· no revisions to workplan necessary.

CDH-S14 Table 4 1 This table needs to be expanded to include an actual or estimated number of each sample type

In addition, the third and sixth objectives listed on the table need to be changed to read "Provide assessment of extent of soil contamination along OPWL pipelines (around OPWL tanks) " The overall goal of this Phase I RFI/RI is to assess the contamination of the source and soils in OU 9. Also, characterizing the contamination "along pipeline alignments: assumes that this is where the contamination will be This assumption may be inappropriate at this time The RFI RI investigation should test the model, but not be structured in a manner that is biased by the model

The sampling/analysis activity described in the "assessment of soil contamination" item is a "grid" around the contaminated test pits. However, the FSP is inconsistent with this, since it only proposes boreholes along the trench, not gridded around the test pit. This inconsistency needs to be addressed.

Response Table 4 1 has been revised in response to this comment and to additions to the FSP The actual number of each sample type is entirely dependent on the

number of sampling locations and the specific configuration of each sampling location This information will not be known until the results of additional data compilation activities (Section 7 2 4) are interpreted to identify sampling locations The FSP therefore identifies the criteria for sampling location selection and the number of samples to be collected under potential pipeline and tank configurations (see Sections 7.3.1 and 7.3.2 and Figures 7-2, 7-3, 7-4, 7-5, and 7-6)

CDH-S15· Section 7 1· As mentioned previously, this investigation should not provide a "preliminary" assessment of the extent of soil contamination; it should completely asses the extent of soil contamination.

Response The reference to a preliminary assessment has been removed throughout the text.

CDH-S16. Section 7 2 1: In light of the previous comment, the descriptions of Stage 1 and Stage 2 seem to be able to establish the complete nature and extent of vadose zone soil contamination, provided that the issue of "gridding" is resolved. If complete characterization can be established, it should be stated in the workplan

Response The FSP has been revised to clarify that the Stage 3 pipeline investigation and the Stage 2 tank investigation are designed to fully assess the extent of vadose zone soil contamination at OU 9

CDH-S17 Section 7 2 2 The final paragraph of this section should reference potential ARARs. The actual final ARAR values are far from being finalized.

Response. This change has been made

CDH-S18 Section 7 2 4 1 The purpose of the second bulleted item is unclear to the Division.

Response The additional data compilation activities discussed in the bulleted list have been revised to better explain the purpose of each activity.

CDH-S19. Section 7 2 4 2 Please invite appropriate members of the CDH and EPA staffs to the Site Walk An understanding of the layout, logistical considerations, and general site characteristics would be very helpful to the regulatory agencies

Response. Comment acknowledged, no revisions to work plan necessary.

CDH-S20 Section 7.3.1.1: Please clarify how DOE arrived at the figure of 100 foot pit spacing

Also, the OPWL carried many mixed and non-radioactive waste streams. However, this section states that wipe samples will only be tested for radionuclide contamination Please add testing for the possible non-rad constituents

During the construction of the test pits, backhoe operations must not be allowed to damage the pipelines The pipelines should be exposed in their in-situ condition so that unbiased decisions can be made as to their integrity and proper sampling locations and techniques. This issue is not discussed in the workplan However, as this document will be used on the field during work-plan implementation, proper test pit procedures must either be discussed or a SOPA developed for reference (in addition to SOPA 11.1 included in the workplan).

The Division recommends that a procedure be developed to pressure test the CPWL pipeline segments between test pits. This type of procedure could be used to help establish leak locations and may aid in locating small areas of contamination between test pits A more important use of this type of information, however, would be to establish segments of pipe that still have integrity and, therefore, have probably never leaked. These segments could be removed from further investigation and characterization and, more importantly, from having to be addressed by a final remedy for this operable unit

Response Section 7 3.1.1 has been revised to explain the 100 foot test pit spacing.

The feasibility of wipe samples for nonradioactive contaminants was discussed with personnel from a contract laboratory. These personnel indicated that wipe sampling can be employed for semivolatiles, which are not expected to be a significant contaminant in the OPWL. Wipe sampling for metals could be attempted, but would in most cases likely be affected by the pipe materials A recommended alternative was to remove and ship a section of the pipeline itself to the laboratory, where various extraction processes could be attempted to isolate residual contaminants This did not seem a feasible option If the regulatory agencies wish to further investigate this option, it can be addressed under a technical memo or a work plan addendum

Section 7 3 1 1 has been revised to better explain test pit excavation procedures

Limited pressure testing of pipelines has been added to the FSP and is addressed in detail in Section 7 3 1 1.

CDH-S21. Section 7 3 1 2· As mentioned previously, the description of the Stage 2 investigation needs to be augmented to include the grid sampling mentioned in Table 4-1. Assessing the contaminant migration only in the direction of the pipeline trenches assumes that the conceptual model is correct and contamination has not migrated out of the trenches. At this time, this assumption may be inappropriate

In addition, this section states that a sample will be taken from the soil boring at a location midway between the trench bottom and the water table or bedrock How will this be determined, since the depth to water or bedrock is not known at a given location until after the midway point is passed? This comment is applicable to Section 7.3.2.1 also.

Response Sections 7 3 1 and 7.3.2 have been revised to better explain the staged approach to the pipeline investigation and the objectives of each stage.

Soil borings will be continuously sampled (cored) per agency-approved EG&G EMD Operating Procedures Analytical samples can be collected from the continuous core after drilling has progressed past the sampling depth

CDH-S22· Section 7 3 2 2· This section needs to clarify that the grid sampling referred to in the text is a soil boring grid

Neither Stage I or Stage II sampling addresses tanks that have already been removed Since the most likely location for contamination in the vadose zone is beneath the tank, for those tanks already removed, soil boring directly through and continuing beneath the original tank location would seem appropriate

Response· The text referring to the referenced sampling grid pattern has been revised to better explain the basis for the pattern.

Section 7.3 2 and figures 7-5 and 7-6 have been revised to clarify the sampling plan for removed tank locations. The suggestion to sample directly beneath the original tank location has been incorporated into this sampling plan

CDH-S23 Section 7 6: This section implies that duplicate samples will be collected 100 percent of the time. This seems excessive.

Response Section 7 6 and Table 7.5 explain QA sampling frequency.

CDH-S24· Section 7 7 By the time this workplan is implemented, the Final PPCD will be in place and should be referenced here.

Response. The Final PPCD has been referenced

CDH-S25: Table 7 2 The EG&G soil scientist does not believe the CDH method for surficial soil sampling gives sufficient guidelines for actually sampling soil, nor does it give consistent results. The Division is not married to the CDH method and would rather see the best method employed for the situation, regardless of who developed it. Whether or not the CDH method is used, CDH soil sampling guidance states that single soil samples must be taken from a point that is representative of the area in question and to which interpretation of the data will extend. This is not clearly stated in SOP GT.8, but is very important Please take this into consideration during the implementation of this workplan.

Response Surface soil sampling methodology has been more clearly explained in the FSP Samples will be collected using the grab method described in EMD OP GT 8. Other methods described in GT.8, including the CDH method, are designed for surveying large areas which have been affected by radionuclide contamination settling onto the land surface in fugitive dust. Potential OPWL surface soil contamination, in contrast, would have been a result of radioactively- and chemically-contaminated aqueous waste either percolating into the surface or being forced to the surface from underground. In either instance, the potential is high for contaminants to occur deeper and more pervasively in the soil than in a fugitive dust pathway scenario Specific application of the grab sample method to OPWL surface soil sampling is explained in Sections 7 3 1 1 and 7 2 3 1

CDH-S26 Figures 7-3 and 7-6 Regarding Example 2 on each of these figures; since unsaturated bedrock is still vadose zone, and since an objective of this workplan is to characterize contaminated soil in the vadose zone, an additional sample should be collected from the uppermost portion of the bedrock that is encountered This will help verify the conceptual model.

Response It is likely that the nature of contamination in the uppermost bedrock, which is deeply weathered, will be very similar to that in the lowermost surficial

deposits (alluvium), which will be sampled per the FSP. The text has been revised to indicate that the sampling location will be the alluvium/bedrock interface.

CDH-S27. Section 10.0 No QAA was transmitted with this document as is indicated by this section Please provide the Division with this document.

Response. The QAA has been included.

CDH-S28. Section 11 2. The title of this section should be "Residue Sampling" instead of "Sediment Sampling "

Response. This change has been made.

RESPONSES TO ENVIRONMENTAL PROTECTION AGENCY COMMENTS FINAL PHASE I RFI/RI WORKPLAN FOR OPERABLE UNIT NO. 9

GENERAL COMMENTS

EPA-G1: The proposed FSP for this Phase I field investigation consists of a data compilation effort followed by Stage 1 and Stage 2 sampling activities. It is unknown at this point the extent to which the proposed Stage 1 sampling activities would be impacted by new information on the OPWL which is to be gathered during the data compilation effort For example, the number and location of the proposed test pits and boreholes may need to be changed due to logistical problems such as security requirements, heavy equipment access restrictions, etc. If it is determined that substantial modifications to the proposed Stage 1 field sampling activities need to be made, then DOE should submit a technical memorandum for EPA and CDH approval.

Response· The scope and extent of Stage 1 field activities, particularly the Stage 1 pipeline investigation, depend almost entirely upon the results of the additional data compilation The results of the data compilation will be presented either as a technical memorandum or as an addendum to the work plan The text has been revised to more clearly indicate this (see Section 7 2 4 3)

EPA-G2 EPA is concerned that the proposed FSP may not be adequate to fully characterize the OPWL This is due to the following concerns. 1) the lack of analyses for PCBs and pesticides in Stage 2 field sampling activities; 2) confusion on sampling intervals for investigation of pipelines (100 or 200 feet), 3) failure to specify the number of soil samples to be taken in each proposed test pit, 4) location of test pits based on the results of the surface soil radiological survey, 5) the proposal to drill boreholes only along the trench, and 6) the lack of a vadose zone monitoring program.

Response See responses to comments EPA-G3 through EPA-G8.

EPA-G3 The possibility exists that PCBs were discharged to the OPWL. Therefore, assuming the absence of these contaminants at this stage is premature. It is EPA's position that the proposed analytical list for stage 1 sample analysis should include analysis for PCBs and pesticides. If it is determined that these contaminants are not present in the OPWL, then there would not be a need for their analysis during any subsequent field investigations.

Response At present, there is no indication that PCBs or pesticides were ever discharged to the OPWL As stated in the text, specific analytes for the OU 9 Phase I RFI/RI will be modified based on the results of waste stream characterization under the additional data compilation activities If it is determined that contaminants not included in the current analytical parameters (including PCBs or pesticides) were discharged to the OPWL in

quantities and/or concentrations likely to be detectable in environmental samples, then these compounds will be added to the analytical parameters

EPA-G4. Section 7.3 1 states that sampling interval along the pipeline alignments is going to be 200 feet. Later, in Section 7.3.1.1 the text states that sampling interval along the pipelines alignments is going to be 100 feet. The FSP needs to clarify what the sampling interval is going to be. EPA prefers that 100 feet is used instead of 200 feet due to the possibility of past releases smaller than 500 gallons which may not travel as far and may not be detected if a 200-foot sampling interval is used.

Response The sampling interval (test pit spacing) for a given section of pipeline is based upon several criteria, including known release history, structural features (e g., valves, elbows, tees), and field observations of pipeline condition Test pit spacing will vary from section to section, and in no instance will be greater than 200 feet. Section 7.3.1.1 has been revised to more clearly indicate the rationale for test pit spacing, which is also explained in Figure 7-2.

EPA-G5 The FSP needs to specify the number of soil samples to be taken at each test pit This must include number of soil samples to be taken in the ground surface, in the trench backfill directly beneath the pipe and in the native soil directly below the trench. It is important that the number of samples to be taken be sufficient to provide reliable information on the contamination of the OPWL.

Response. The actual number of each sample type that will be collected during the Phase I RFI/RI is entirely dependent on the number of sampling locations and the specific configuration of each sampling location. This information will not be known until the results of additional data compilation activities (Section 7 2 4) are interpreted to identify sampling locations. The FSP therefore identifies the criteria for sampling location selection and the number of samples to be collected under potential pipeline and tank configurations (see Sections 7 3 1 and 7.3 2 and Figures 7-2, 7-3, 7-4, 7-5, and 7-6).

EPA-G6 It is unlikely that the OPWL have contributed to surface soil contamination Therefore, using the surface soil radiological survey results for selection of sampling locations is not appropriate DOE should acknowledge that the radiological survey will provide information useful from the safety standpoint and that it may not provide information on contaminated areas due to past releases from the OPWL DOE should reevaluate the criteria for sampling

locations to ensure that the OPWL will be characterized to the greatest possible extent

Response The use of the pre-intrusive work surface radiation survey to modify test pit and boring locations has been removed. The criteria for sampling locations has been more clearly described in the FSP (see also responses to comments EPA-G1 and EPA-G4) However, it is known that some OPWL releases (both underground pipeline releases and aboveground tank leaks or overflows) did impact surface soils. Surface radiation surveys designed specifically for site characterization will be conducted at these sites.

EPA-G7: This FSP proposes that for each test pit, boreholes would be drilled along the trench. In addition to this, the FSP needs to include the contingency to drill boreholes perpendicular to the pipelines at least for those locations where evidence of releases is encountered Only in this manner can DOE determine the direction and extent of the spread of a release.

Response. The need for borings drilled perpendicular to the pipelines (i.e , in native soils adjacent to the pipeline trench) will be evaluated on a site-by-site basis after the results of borings drilled in the trench (Stage 2 borings) are known Section 7 3.1 3, Stage 3 Investigation, has been added to the text to more clearly indicate this stage of the pipeline investigation.

EPA-G8. This workplan fails to address characterization of soils within the vadose zone This is a very important component of the FSP, since it would provide information needed to evaluate the extent of soil contamination within the vadose zone and to study the fate and transport of contaminants in the subsurface It is EPA's position that the FSP needs to include a vadose zone monitoring program EPA recommends DOE use the results of test pits and borehole sampling activities to focus vadose zone monitoring on areas which are found to be contaminated.

Response The FSP has been revised to clarify that the Stage 3 pipeline investigation and the Stage 2 tank investigation are designed to fully assess the extent of vadose zone soil contamination at OU 9 Vadose zone monitoring will be considered after the extent of vadose zone soil contamination has been assessed

EPA-G9: This workplan needs to explain how the risk assessment and environmental evaluation process, and the phase I/phase II scheme set up in the IAG fit together While all field activities should be designed and conducted to support completion of a risk assessment and environmental evaluation, this

phase I effort is restricted to source definition in support of closure. The information obtained will be utilized in assessing risk from this OU, but may not be sufficient to conclude that task nor to conduct environmental evaluations Some exposure pathways may not be ready for full evaluation until after phase II when characterization information on other transport media such as ground water, surface water, air, and biota is gathered.

Response Section 2 5 4 has been revised to emphasize the role of the Phase I and Phase II RFI/RIs in evaluation of particular exposure pathways. This section indicates that evaluation of pathways involving air, surface water, groundwater, and biota will not be quantitatively evaluated until Phase II data are collected.

EPA-G10. In addition, the BRA presented in this workplan consists of a generic guidance or approach to be followed when evaluating the potential human risks and environmental impacts associated with a given site. Site-specific conditions are not discussed in detail nor are methods provided for dealing with site-specific conditions The BRA needs to be revised to consider and discuss site-specific conditions and applicable approaches.

Response· As explained in Section 2 5 4, the only pathway which will be evaluated during the Phase I RFI/RI is direct ingestion of or dermal contact with surface soils Evaluation of this pathway will be provided in the Phase I RFI/RI Report.

SPECIFIC COMMENTS

EPA-S1 Section 2 2 2 2, Operation, page 2-5 The text states that process wastes from the OPWL were forwarded to the process waste treatment facility (Building 774) It is unclear whether wastes from all buildings using the OPWL were transferred to building 774. The text should state the extent to which OPWL waste was treated by building 774 and if any other treatment facilities were used.

Response· It is known that facilities other than Building 774 were used to treat process wastes, however, detailed information is not yet available. Efforts will be made during additional data compilation activities to clarify the disposition of OPWL wastes. Sections 2 2 2 2 and 7 2 4 have been revised to more clearly indicate this

EPA-S2. Section 2 5 1, Conceptual Model, page 2-23: Soils and groundwater can both be directly impacted by a release of contaminants from the tanks and pipelines This conceptual model should account for this possibility and should recognize that soils and groundwater can serve as a secondary contaminant sources

Response· The conceptual model has been revised to identify contaminated soil as a current contaminant source. It is possible that groundwater has been directly impacted by OPWL releases and could therefore also be considered a current source, however, the resulting exposure pathways will not differ from those that involve groundwater as a transport medium. For the sake of simplicity, groundwater is described only as a transport medium in the conceptual model

EPA-S3· Section 2 5 2 1, Pipeline Releases, page 2-26· This section states that the hypothetical plume for a 500 gallon release would extend approximately 300 feet along the trench It is unclear how this 300 feet was calculated. This section needs to present the respective calculations.

In addition, the release volume of 500 gallons may be too liberal since smaller releases of highly concentrated contaminants would not travel as far and may not be detected if a 200-foot sampling location interval is used. Therefore, soil sampling locations should be located closer than 200 feet. DOE should reevaluate and justify its assumptions concerning release volume and extent of the release

Response. The calculation of release spread has been provided in Table 2.8.

The 200 foot maximum test pit spacing resulting from the conceptual model is a contingency in the absence of structural features (e.g., elbows, tees, valves), known release locations, or visible deterioration, and is expected to be utilized only on a few long sections of pipeline. Clearly, pipeline releases smaller than the 500 gallon conceptual model volume may have occurred. No approach short of complete excavation and composite sampling could ensure that all such releases are detected The FSP is designed to provide a reasonable and diligent effort toward locating those releases which are likely to constitute a potential threat to human health or the environment. The text in the conceptual model and in the FSP (Section 7.0) has been revised to more clearly explain the significance of the pipeline release model and the rationale behind the FSP

EPA-S4: Section 3 0, Applicable or Relevant and Appropriate Requirements: DOE is in the process of preparing a site-wide document defining all potential ARARs EPA reserved the right to comment on this section until the draft document of potential site-wide ARARs is completed and submitted to the regulatory agencies.

Response. Comment acknowledged, no revisions to work plan necessary.

EPA-S5: Section 7 2 2, Analytical Rationale, page 7-2: This section states that PCBs and pesticides are not included on the phase I analyte list for OU9. However, Table 2 6 states that, for some buildings, there is a possibility that PCBs were discharged to the OPWL. Also, the text states that the assumption regarding the absence of PCBs and pesticides could change in the future if they are detected. Yet if they are not being analyzed for, they cannot be detected Therefore, stage 1 sampling activities must include analysis for these contaminants. If it is determined that these contaminants are not present during stage 1, then analysis for these parameters can be omitted for stage 2 sampling activities.

Response See response to comment EPA-G3

EPA-S6· Section 7 3 4 1, Objectives, page 7-4: One of the objectives listed in this section is to compile additional data for the identification of pumped (force-flow) waste lines Earlier, in Section 3.0, the OPWL is described as using only flow under gravity drainage. DOE should explain this inconsistency.

Response· Forced-flow pipelines will be identified under the additional data compilation activities (Section 7 2 4)

EPA-S7: Table 7 1: Table 7.1 lists analytical parameters for stage 1 sampling activities at OU9 The table contains all wastes described as being transferred through the OPWL except for iodine, phosphate, and ammonium thiocyanate These contaminants should be included in the analyte list.

Response. Iodine, phosphate, and ammonium thiocyanate are among numerous potential OPWL waste components that are identified in Table 2.6, OPWL Waste Stream Characterization, but are not included in the Stage 1 analytical parameters listed in Table 7 1. Other examples include photographic processing compounds (see Building 771 and Building 779 in Table 2.6), ethylene glycol (Building 123), and the radionuclides neptunium (Building 881) and curium (Building 123) If it is determined during additional data compilation activities that these or any other compounds not listed in Table

7.1 were discharged to the OPWL in quantities and/or concentrations likely to be detectable in environmental samples, then these compounds will be added to the analytical parameters.

EPA-S8. Figure 7-1: Figure 7-1 depicts tentative sampling locations for OU9. The map does not show locations of past releases. The map should show the location of known releases from the OPWL.

Response. Very limited information exists for specific OPWL release locations. The results of additional data compilation activities (Section 7.2.4), including release locations, will be provided in a technical memo or work plan addendum

EPA-S9: Section 7.3 1 1, Stage 1 Investigation, page 7-7: This section needs to specify the number of samples per test pit to be taken from residue of pipelines, pipeline trench backfill and native soils beneath the pipeline trench

Also, this section proposes a maximum spacing of 100 feet between each test pit to be excavated in areas where exact release locations could not be discerned from historical information This contradicts section 7 3.1 which proposes a maximum spacing of 200 feet along pipeline alignments. This discrepancy needs to be resolved or explained·

It is more likely that surface soil contamination in the OPWL, if any, originated from other areas rather than from OPWL releases. Therefore, surface soil radiological survey should not be used to pinpoint test pit locations Instead, field radiological survey should be used from the safety standpoint to avoid working or to take precautions when conducting field activities on a contaminated area.

If groundwater is encountered during the excavation of a test pit, EPA recommends taking groundwater samples This would provide preliminary information on groundwater contamination which could be used when designing the Phase II FSP

Response See response to comment EPA-G5 Section 7.3.1.1 has been revised to clarify test pit spacing The reference to focusing test pit locations using the pre-intrusive work surface radiation survey has been removed, however, a site characterization surface radiation survey has been added to the FSP for locations of potential surface soil impacts due to OPWL releases Sampling of groundwater encountered in test pits has also been added to the FSP

EPA-S10 Section 7 3 1 2, Stage 2 Investigation, page 7-9: This section states that one of the objectives of stage 2 activities is to investigate the extent of contaminated vadose zone soils. However, the proposed field activities for stage 2 do not include a vadose monitoring program. This FSP needs to address vadose monitoring. EPA recommends that at least vadose zone monitoring be performed in areas found to be contaminated due to previous releases

If contamination is encountered when excavating a test pit, then soil borings should be placed perpendicular to the pipeline, as well as along the trench. This is the only way to find out the extent and direction of the plume

Response The FSP has been revised to clarify that the Stage 3 pipeline investigation and the Stage 2 tank investigation are designed to fully assess the extent of vadose zone soil contamination at OU 9 Vadose zone monitoring will be considered after the extent of vadose zone soil contamination has been assessed

The Stage 3 pipeline investigation will evaluate native soils adjacent to the pipeline trench as necessary The Stage 3 pipeline investigation is discussed in Section 7 3 1.3

EPA-S11. Section 7 4 2, Analytical Requirements, page 7-15: PCBs and pesticides must be included in the analytical parameter list during stage 1 activities. If it is determined that these contaminants are not present in the OPWL, then analysis for these parameters must be omitted from stage 2 sample analysis.

Response See response to comment EPA-G5.

EPA-S12. Table 7.2 This table needs to be changed according to the comments on the FSP section

Response The table has been revised in accordance with additions and changes to the FSP

EPA-S13 Section 8 3 5, Exposure Point Concentrations, page 8-9: The risk assessment section discusses the use of models to describe the fate and transport of contaminants in determining exposure point concentrations. No specific models are mentioned DOE should specifically reference models it may use to determine exposure point concentrations for the baseline risk assessment.

Response· EPA-recommended and approved computer modeling programs (e.g., AIRDOS) will be utilized for determination of potential impacts on human receptors The text in Section 8.3 5 has been revised to more clearly indicate this.

EPA-S14 Section 9.1 3 1, Types, Condition, and Extent, page 9-10: The text states the control and management of the area for weeds allows limited plant growth. It should be noted that the application of herbicides could serve as a source of contamination for OU9.

Response: A revised approach to EEs in industrialized areas of RFP will be considered in a February 21 meeting between representatives of DOE, CDH, EPA, and EG&G. An example revised EE based on OU 9 will be prepared for this meeting Because the approach to the OU 9 EEW is likely to change significantly, the existing Section 9 0 was not revised for the final Phase I RFI/RI Work Plan

EPA-S15. 9 2 2 1, Collect and Evaluate Existing Site Data and Information, page 9-19: The text describes studies conducted at Rocky Flats on radionuclide uptake, retention, and effects on plant and animal, but does not provide a citation for the studies References should be provided for all the studies to be used for basic information

Response. See response to comment EPA-S14.

EPA-S16 Section 9.3 2, DQOs for each activity, page 9-39: The text states that the general data quality objectives (DQOs) for the environmental evaluation are provided in section 9 1 2 3 There is no section 9.1.2 3 in the workplan and the discussion on DQOs should be provided

Response. See response to comment EPA-S14.